

**Program:** Partnership

**Project Title:** “Enhancing Northeastern alfalfa/corn IPM stakeholder skills with Online Resources and Field Training”

**Project Type:** Regional IPM Communications

**Project Director:** Ken Wise, Cornell University, NYS IPM

**Co-PDs:** J. Keith Waldron, Cornell University, NYS IPM

**Start Date:** March 1, 2015

**End Date:** February 28, 2016

**Funding:** \$14,000

**Funds leveraged as a result of this project** (e.g., additional grants received for this work):

NA

**Number of People Reached as a result of this project:** Field Meetings 57 producers, Training videos so far 30 views.

### **Summary**

Seven integrated pest management training videos on field corn and alfalfa insect pests and diseases were created for online use by agricultural professionals and producer/growers. In addition, three hands-on field meetings in alfalfa and field corn IPM were held in Eastern New York. Impacts relative to the adoption of IPM practices were measured at each field meeting.

### **Problem, Background, and Justification**

Field corn and alfalfa comprise about 55% of New York’s 3.5 million tillable crop acres. Most of the field corn and alfalfa in NY is grown as feed for our dairy industry. In 2012, the value of field corn grown as grain or silage in NY was over \$1.2 billion. If you add the value of perennial forages, including alfalfa and other hay value of these field crops exceed \$1.5 billion (Cox 2013). According to National Agricultural Statistics, more than 4 million acres of field corn and 1.5 million acres of alfalfa/alfalfa grass mixes are produced in the Northeastern US (NASS 2014). Corn and alfalfa provide a sound foundation for our livestock based agricultural economy. Given the importance of corn and alfalfa production to NY and the NE region, producers want to optimize efforts to protect their crop investment and enhance net profitability.

Damage from insect, disease, weed and vertebrate pests can directly and significantly reduce crop yield and quality. Environmental and health concerns about pesticides have elevated interest in and the need for effective/efficient field crop production. With the present economic constraints on field crop production, the demand for knowledge on how to better manage field corn and alfalfa has become increasingly important and relevant. The use of Integrated Pest

Management (IPM) is a proven method to help protect the environment, reduce potential health risks associated with pesticide use and while providing opportunities for significant economic benefits by integrating a set of appropriate cultural, biological, mechanical, and chemical options to minimize, avoid and manage pest problems. The number of farms in NY has decreased over the last 10 years, while average farm size has increased. With the increase in farm size, has come an increase in constraints on time and labor management issues including the time available for crop monitoring and IPM implementation. To fill this area of need many producers hire crop advisors to provide recommendations for crop and pest management to grow high quality crops in the most economical way while still protecting the health of people and the environment. Many of these crop advisors and consulting businesses hire new professional staff each year. This proposal will address the priority of “Training the Next Generation of IPM Researchers and Practitioners”

A responsibility of the NYS Eastern NYS IPM Area Specialist is training new Cornell Cooperative field crop extension educators in field corn and alfalfa IPM. During 2013 the Eastern NYS IPM Educator trained 3 new extension field crop educators, in three separate counties, how to implement IPM for field corn and alfalfa. While the one-on-one train-the-trainer education was very effective, the long commutes between extension offices presented challenges. The time commitment averaged 8 trips to each county over the course of the summer at 2 to 3 days a week travel at 100 miles/trip. This totaled 2,400 miles and about 40 hours of just driving. Preparing for each meeting and training was a full day's work totaling 192 hours over the summer. The training effort was successful, however, travel time had it's obvious downside and more time-efficient options need to be designed to meet the IPM educational needs of new agricultural personnel. The most recent NYS IPM Livestock/Field Crop IPM Stakeholder Priorities identify “IPM educational outreach to enhance knowledge, use and adoption of IPM approaches to managing pests of field crops and livestock as a high priority. (<http://www.nysipm.cornell.edu/grantspgm/default.asp>).

Access to IPM education programs may not always be possible due to a lack of offerings, an inconvenient location, competing commitments or other factors. Online training modules offer a practical alternative that allows flexible timing with little or no travel required.

We proposed two options for providing field corn and alfalfa IPM training for the next generation of agricultural professionals: development of educational IPM videos and field training. Many new and experienced producers and other agricultural professionals such as: certified crop advisors, USDA technical service providers and staff, crop consultants, cooperative extension personnel and others would benefit from field corn and alfalfa IPM education. To reach such a large target audience of diverse stakeholders, we proposed to develop a series of short topical educational videos that would be made available online. The use of online videos, workshops or webinar technology has dramatically increased in recent years. Producers and those working with them often have limited time available for learning new

material or reviewing old subject areas. The benefit of online education is that it is ready to be accessed and viewed at any time. We proposed to develop a series of 5 single topic, succinct training videos highlighting basic IPM information on common alfalfa and corn pest problems. In the end we prepared 7 videos. Each video focused on correct identification, monitoring, assessment and guidelines for management for a particular pest. Each video is approximately 4 to 9 minutes in length. We focused on the major pest issues that affect corn and alfalfa including: seed corn maggot, black cutworm, corn rootworm, gray leaf spot, northern corn leaf blight, potato leafhopper in alfalfa, and alfalfa weevil. Videos were developed with input and beta tested with CCE personnel and others. Completed training videos were posted and are now available to clientele on the NYS IPM Field Crops You-Tube web channel.

<http://www.youtube.com/user/NYSIPM>.

A second component of this project was field corn and alfalfa IPM field meetings for agricultural professionals and producers. Adult learning research indicates farmers, crop consultants and extension educators adopt targeted new farming practices when the educational design promotes open discussion and experiential hands-on learning on the farm (Richardson 1994; Wuest et al. 1995). Having on-farm field corn and alfalfa IPM meetings across NY increased stakeholder IPM awareness and encourage the use of IPM practices. Three field meetings were held in strategic locations in Albany, Columbia and Dutchess Counties.

## **Objectives**

1. Develop a series of online training videos on IPM for field corn and alfalfa for the next generation of agricultural professionals in NY and the Northeast.
2. Conduct field meetings on IPM for field corn and alfalfa for the next generation of agricultural professionals
3. Measure adoption of IPM practices by users of the training videos and field meetings.

Project impacts of online teaching modules and field meetings were measured through a post-test survey to determine what was learned and the intention to-adopt IPM practices by each participant. In similar programs the rate of adoption of IPM practices is about 80% (Wise 2010).

## **Approach and Procedures**

Objective 1: Develop a series of online training videos on IPM for Field Corn and Alfalfa for the next generation of agricultural professionals in NY and the Northeast.

We developed a series of online IPM videos for specific field corn and alfalfa pests to train the next generation of IPM professionals. We developed seven 4 - 9 minute long videos for each pest issue. Each video focused on correct identification, monitoring, assessment and guidelines for management of each issue. We developed a script for each topic, inserted photos and video footage taken during the growing season, and added narration to complete the video training module. Videos were completed for IPM approached to managing: seed corn maggot, black

cutworm, corn rootworm, gray leafspot, northern corn leaf blight, potato leafhopper in alfalfa, and alfalfa weevil. Each training video has been posted and is available to clientele on the NYS IPM Field Crops You-Tube web channel. <http://www.youtube.com/user/NYSIPM>. We worked in cooperation with several Cornell Cooperative Extension educators in developing these training videos.

Objective 2: Conduct field meetings on IPM for Field Corn and Alfalfa for the next generation of agricultural professionals

On-farm and hands-on training is an important aspect of insuring the next generation of agricultural professionals know how to use IPM. The increase in knowledge and willingness to use new practices on the farm increases when you give the participant the opportunity see, hear and do IPM in real time. Two Cornell Cooperative Extension collaborators volunteered to host IPM educational field meetings in eastern NY (Schoharie, Columbia and Dutchess Counties). Aaron Gabriel (Schoharie and Columbia) held corn and alfalfa meetings, while Jennifer Fimbel (Dutchess County) held an alfalfa meeting. Meetings focused on timely pest issues of field corn and alfalfa. During the meetings we presented an overview of an IPM approach to managing field corn and alfalfa pests, demonstrated techniques to monitor, assess and evaluate current pest issues in the field and discussed resources available to aide decision making.

Objective 3: Measure adoption of IPM practices by users and participants

Measuring behavioral change by participants is a vital component in any educational model. Program impacts were measured through post-testing participants to determine changes in participant knowledge and use of IPM practices. Both online learning and hands-on in the field education have the potential to dramatically increase knowledge and the rate of adoption of IPM practices. After completing an online video or field meeting participants completed a short survey to measure changes in the level of intent to adopt specific IPM practices. Program evaluations included documentation of the intention to use new practices and knowledge of IPM practices, scouting activities, changes in pesticide usage, changes in cropping strategies to reduce pest and environmental problems, crop and variety selection for pest control, and more. Yifen Lin, NE IPM Program and Evaluation Specialist helped us with designing the post evaluations for both the field meetings and the online surveys. It was a very big help to the project!

## **Progress**

Finished

## **Breakdown of leveraged funds and people reached (required)**

No additional funds have been leveraged to date from this project. We directly reached 57 producers who participated in field meetings. To date (1.28.16), the online training videos have had 300 views.

**Outcomes** (Please copy and paste into the special “Outcomes” section in addition to providing this information in the body of your report.

**Training Videos:**

We produced 7 online training videos in IPM for field corn and alfalfa. Most of the growing season was spent getting photos and video clips to produce the IPM training videos. Once the images were collected scripts and narration were produced. Ken Wise did the video narration using a Microsoft sound recorder on the computer. Once the narration was recorded the images and sound were merged to develop the final product using Adobe Premier Pro video editing software. The following were videos were produced:

<a href="#">Integrated Pest Management for Seed Corn Maggot in Field Corn,</a>	Published 1/5/2016
<a href="#">Integrated Pest Management for Black Cutworm on Field Corn,</a>	Published 11/25/2015
<a href="#">Integrated Pest Management for Corn Rootworm on Field Corn,</a>	Published 11/25/2015
<a href="#">Integrated Pest Management for Northern Corn Leaf Blight on Field Corn,</a>	Published 11/10/2015
<a href="#">Integrated Pest Management for Gray Leaf Spot on Field Corn,</a>	Published 11/6/2015
<a href="#">Integrated Pest Management for Alfalfa Weevil on Alfalfa,</a>	Published 8/18/2015
<a href="#">Integrated Pest Management for Potato Leafhopper on Alfalfa,</a>	Published 7/16/2015

**Field Training:**

The second aspect of the project was implementation of 3 on-farm hands-on field corn and alfalfa IPM meetings. We cooperated with Aaron Gabriel (CCE Capital Region Agronomist) and Jennifer Fimbel (CCE Dutchess County) in providing 2 alfalfa IPM meetings and 1 field corn IPM meeting (table 1).

**Table 1. On-Farm Field IPM Meetings Conducted in Eastern NY**

Cooperator	Subject	Date	Location	Number of Participants
Jennifer Fimbel	Early Season Alfalfa IPM	6/2/15	Amenia (Dutchess County)	8
Aaron Gabriel	Managing Pests in the New World of Alfalfa Traits	6/23/2015	Easton (Washington County)	24
Aaron Gabriel	Corn Rootworm Integrated Pest Management	8/5/15	Berne, NY (Albany County)	25
			TOTAL	57

At the completion of each on-farm meeting producers were asked to fill out an exit/adoption of IPM survey.

**Impacts** (Please copy and paste into the special “Impacts” section in addition to providing this information in the body of your report.

The videos were produced over the course of the summer season. While each online IPM training video produced has an online survey there have been very few evaluations to date. The evaluations will remain with each video to measure their usefulness to viewers over time. To date (1.28.16), the 7 videos have been viewed 300 times. In our beta-test we asked several Cornell Cooperative Extension field crop educators review the videos. Table 2 and 3 summarize their analysis of the videos. Note that there are very few responses evaluating the videos.

**Table 2: Extension educator responses to survey questions relative to the online training videos**

<b>This video helped you learn more about (video subject listed below)</b>	<b>highly agree</b>	<b>agree</b>	<b>not sure</b>	<b>disagree</b>	<b>strongly disagree</b>
Potato Leafhopper Video (N=5)	80%	20%	0%	0%	0%
Alfalfa Weevil Video (N=3)	33%	67%	0%	0%	0%
Corn Rootworm Video (N=3)	33%	67%	0%	0%	0%
Seed Corn Maggot Video (N=3)	33%	33%	33%	0%	0%
Black Cutworm Video (N=3)	33%	67%	0%	0%	0%
Gray Leaf Spot Video (N=3)	67%	33%	0%	0%	0%
Northern Corn Leaf Blight Video (N=3)	33%	67%	0%	0%	0%
<b>Rate the quality of this video</b>	<b>very useful</b>	<b>useful</b>	<b>not sure</b>	<b>not useful</b>	<b>not at all useful</b>
Potato Leafhopper Video (N=5)	60%	40%	0%	0%	0%
Alfalfa Weevil Video (N=3)	33%	67%	0%	0%	0%
Corn Rootworm Video (N=3)	0%	67%	0%	0%	33%
Seed Corn Maggot Video (N=3)	0%	67%	0%	0%	33%
Black Cutworm Video (N=3)	33%	67%	0%	0%	0%
Gray Leaf Spot Video (N=3)	67%	33%	0%	0%	0%
Northern Corn Leaf Blight Video (N=3)	33%	33%	33%	0%	0%

**Table 3: Responses to survey questions “Will you use this video for extension education or crop consulting?”**

	Yes	No
Potato Leafhopper Video (N=2)	100%	0%
Corn Rootworm Video (N=3)	67%	33%
Seed Corn Maggot Video (N=2)	50%	50%
Black Cutworm Video (N=3)	100%	0%
Gray Leaf Spot Video (N=2)	100%	0%
Northern Corn Leaf Blight Video (N=3)	100%	0%

There were some specific suggestions to add certain information and small edits to some of the videos. We will add to and edit the videos to reflect the suggestions. We will have better data from a wider audience including producer and other agricultural professionals by the end of the coming growing season. Will can share this impact information by fall of 2016.

#### On-Farm Alfalfa and Field Corn IPM Meetings

The on-farm hands-on field meetings were successful in helping producers to learn and adopt IPM practices. Throughout the data presented, the majority of producers indicated that it was “extremely likely” or “likely” that they would use most of the IPM and ICM practices that were taught. For the most part, producers indicated that they would use thresholds, keep records and scout for insect, pest, weeds and diseases of both field corn and alfalfa.

Many producers indicated will likely use alfalfa varieties and corn hybrids that contain resistance to certain insect pests. Eighty-one percent of respondents indicated that they would be (extremely likely” and “likely”) to use potato leafhopper resistant alfalfa and 100% would use corn hybrids with resistance to certain insect pests and diseases (Table 4 and 5). This indicates an inclination towards use of IPM tactics that can reduce the pesticide use in field corn and alfalfa production. When asked if they would use roundup ready alfalfa only 18% indicated that they would “likely” use this technology. For corn with the bt gene for corn rootworm and roundup ready 73% (extremely likely” and “likely”) indicated that they would use this technology in the future. But 50% of the producers indicated that they will use conventional corn hybrids in their farming operation. This will help with reducing weeds and corn rootworm resistance to pesticides if planned correctly.

**Table 4: Intention to adopt Alfalfa IPM Practices (N=13)**

	Extremely Likely	Likely	Have not considered	Unlikely	Extremely Unlikely
Use threshold tables and guidelines	18%	45%	37%	0%	0%
Keep Scouting Records and Management Action Reports	10%	36%	45%	9%	0%
Scout alfalfa insect pests/diseases (you or a consulting service)	27%	55%	9%	9%	0%
Conduct weed surveys (you or a consulting service)	27%	36%	10%	27%	0%
Conduct plant population counts (you or a consulting service)	27%	73%	0%	0%	0%
Plant resistant alfalfa for potato leafhopper?	36%	45%	9.5%	9.5%	0%
You plan to use roundup ready alfalfa?	0%	18%	27%	36%	19%



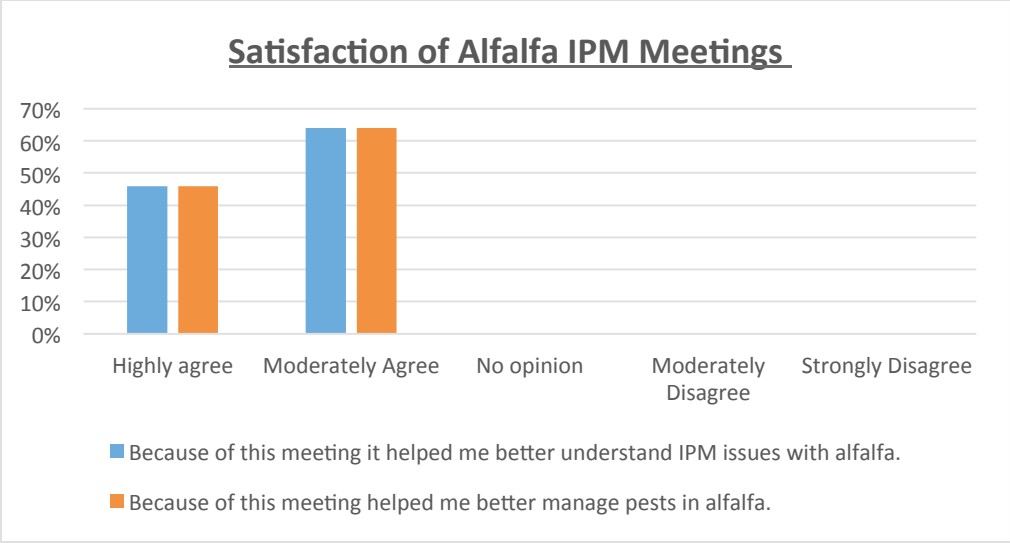
**Table 5: Intention to adopt Field Corn IPM Practices (N=13)**

	<b>Extremely Likely</b>	<b>Likely</b>	<b>Have not considered</b>	<b>Unlikely</b>	<b>Extremely Unlikely</b>
Use threshold tables and guidelines	33%	67%	0%	0%	0%
Keep Scouting Records and Management Action Reports	54%	27%	27%	0%	0%
Scout corn insect pests/diseases (you or a consulting service)	42%	58%	0%	0%	0%
Conduct weed surveys (you or a consulting service)	55%	45%	5%	0%	0%
Conduct plant population counts (you or a consulting service)	33%	50%	8.5%	8.5%	0%
Plant resistant corn for certain insect pests and diseases?	55%	45%	0%	0%	0%
You will plant conventional corn	30%	20%	30%	10%	10%
You plant transgenic corn with the Bt and roundup ready gene?	55%	18%	9%	9%	9%

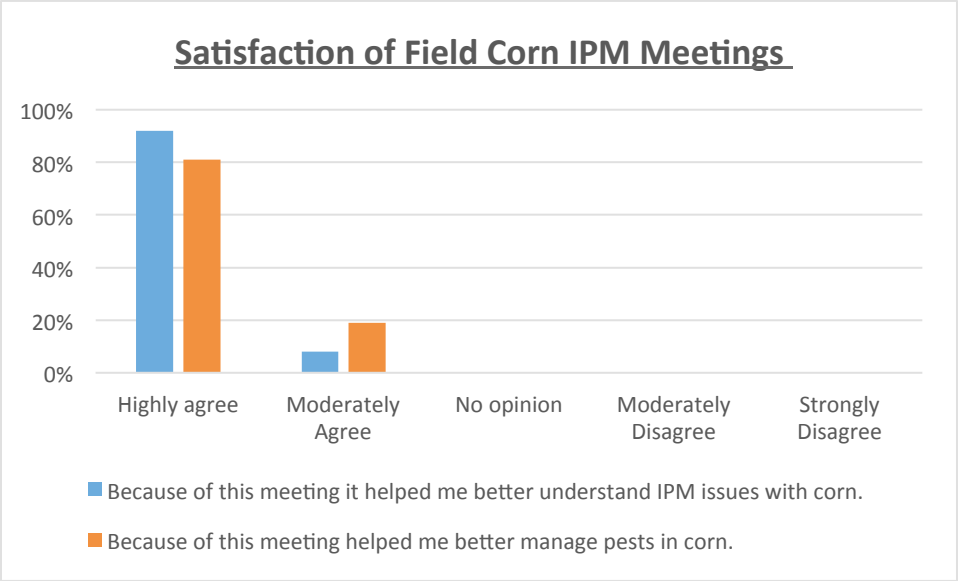
**Satisfaction of on-farm meetings:**

The producers attending the field meetings provided very positive feedback regarding their training experience. One hundred percent of the participants either “highly agreed” or “agreed” that the program helped them better understand pest and crop management issues and become better managers of alfalfa and field corn (figure 1 and 2). Table 6 and 7 are comments made about the on-farm meetings.

**Figure 1: Satisfaction of Alfalfa IPM Meetings**



**Figure 2: Satisfaction of Field Corn IPM Meeting**



**Table6: What is you most like or dislike about the meeting: Alfalfa**

Very informative. Helps a great deal even for a vegetable grower. Good to understand the insect problems
I like the interaction with the crowd
I get more out of a meeting held “in the field” with a local neighbor!
Allowing farmers to exchange experiences. Growing and planting of seedings.
Open Discussion with everyone

**Table 7: What is you most like or dislike about the meeting: Field Corn**

Hands-on Field Demonstration
Very educational about corn and disease
Scouting
Scouting of fields and round table discussion
Learned more about bugs
It was local
Hands-on trains and explanations

The project has proven to be an excellent educational model for producers and agricultural professionals to learn and implement the IPM philosophy and its practices into their farm operation and/or professional work. The availability of online videos combined with on-farm hands-on trainings gives New York producers and professional two means to gain knowledge and skills in implementing an IPM program into their corn and alfalfa production and work. For agricultural professionals it is a means to gain the skills needed to help producers learn IPM practices. Overwhelmingly, the producers and agricultural professionals involved indicated a willingness to implement many of the IPM practices highlighted in the field meetings and online videos.

## References Cited

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Appendices: 1. Photos of some of the meetings we held:



Alfalfa IPM Meeting: Dutchess County June 2015: Learning about alfalfa root health and when to rotate to a new crop.



IPM Field Corn Meeting: Albany County, August 2015



Learning how to scout for corn rootworm





Learning about the importance of healthy plants